	A	B	C	D	E
1		**Fisheries Task Force PM&E Review and Recommendations**			**7/25/03**
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
3	List the number of the Resource Action	Describe the mechanism or mode of action that could be used to accomplish the resource goal (i.e., *how* to achieve the objective). Some objectives may be achieved using more than one mechanism or a combination of mechanisms (changes in operations, installation of new structures or elimination of existing structures, addition of monitoring programs, changes to existing management plans, modification of habitat, etc.)	Describe the location (i.e., geographic area) at/in which the Resource Action would occur as specifically as possible (i.e., Low Flow Channel, High Flow Channel, Shanghai Bench)	**Level of Certainty of Accomplishing the Goal**	Summarize the recommendations of the Fisheries Task Force regarding this resource action. Proposed resource actions may be considered 1) Category 1 Complete: meaning that sufficient specificity is provided to evaluate the action and that the data required to evaluate the action is currently available; 2) Category 2 Waiting: meaning that sufficient specificity is provided to evaluate the action, but that the anticipated required supporting data is not yet available; 3) Category 3 Needs New Information: meaning that there is insufficient supporting science or quantification of the problem and would need to be developed as an adaptive management and monitoring program; and 4) Category 4 Not Recommended: meaning that they are either redundant with other proposed resource actions, actions which are not actually PM&Es, or actions which are deemed by the collaborative to be undesirable (i.e., stock northern pike in Lake Oroville).
4				Detail the likelihood/certainty that the action will accomplish the goal.	
5	EWG-4B	Provide flow pulses that will serve as attraction flows for: - adult splittail (Jan - April) - adult shad (May - June) and - adult sturgeon (February - June). Secondarily, pulse flows would serve as attraction flows for: - adult spring-run Chinook salmon (March - June) - adult steelhead (Sept - Jan) (FR-15) (FR-29)	High Flow Channel	The magnitude, duration, and frequency of pulse flows to attract fish have not been defined or documented. The response of shad, splittail and sturgeon to pulse flows in the Feather River has not been investigated, and is not scheduled to be investigated as a part of the FERC relicensing effort. Because pulse flows have not been defined or documented and because there is not definitive evidence regarding biological response to pulse flows, this resource action is regarded as experimental. Therefore it is considered relatively uncertain that providing pulse flows would provide increased recruitment of these fish to the Feather River. Because fish response to pulse flows is not well documented or well understood, the pulse flow prescription would need to be part of an adaptive management program which would monitor of fish response to experimental pulse flows under a range of conditions.	Category 3 - Needs New Information: The magnitude, duration, and frequency of pulse flows to attract fish have not been defined or documented. The response of shad, splittail and sturgeon to pulse flows in the Feather River has not been investigated, and is not currently planned to be investigated as a part of the FERC relicensing effort. Because pulse flows have not been defined or documented and because there is not definitive evidence regarding biological response to pulse flows, at this time there is not sufficient supporting science available to support development of this resource action to a point where its success can be relatively certain. In order for this proposed Resource Action to become a viable proposal for promotion to the next level of consideration, an adaptive management program would need to be developed (design of experimental flows under various conditions tightly coupled with a monitoring program to characterize (quantify) the resource response to the flow pulses).

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
6	EWG-97	Provide passage for spring-run Chinook salmon above Oroville Dam: Collect adult spring-run Chinook salmon at the Feather River Hatchery and truck them around Oroville Dam as part of a trap and truck program. Release the trucked spring-run Chinook salmon in Lake Oroville tributary arms. Allow adult spring-run Chinook salmon to migrate upstream around existing dams on upstream tributaries (fish ladder to be installed on each upstream dam) and spawn in tributaries upstream of Lake Oroville. Emigration of juvenile spring-run Chinook salmon to the arms of Lake Oroville (or just upstream of Lake Oroville) would be facilitated by installing high-speed screens, modular incline plane screen, or Eiker screens on the intervening dams. Juvenile spring-run Chinook salmon could be collected just above or in the upstream portion of Lake Oroville using a variety and probably combination of methods. Proposed methods include a small diversion weir and fish screening facility; a gulper system such as that on Lake Baker with pumps, screens, and a fish transport pipe; and a bioacoustic fish fen	Multiple locations of facilities and activities required - Feather River fish capture, holding, sorting and transfer to truck facilities (probably at hatchery); truck storage and maintenance; release locations/transfer facilities in upstream tributaries; multiple fish ladders, screens and diversion devices at each upstream facility; diversion weir fish screens, holding and transfer facilities in each tributary for low flow capture of juveniles; bubble screens,	A thorough feasibility analysis is required in order to determine whether the benefits associated with re-introducing spring-run Chinook salmon into historical habitat would outweigh the risks associated with potential transmittion of fish disease and impacts to resident and coldwater reservoir fisheries, predation, genetic introgression and potential competition for food and habitat with existing resident fish species, as well as the risk of potential negative effects on the target species (e.g., potential take associated with handling). The feasibility analysis associated with SP-F15 will provide this evaluation for the geographic area extending from the Feather River to the first upstream fish passage barrier. The likelihood of accomplishing the goal within this geographic area will be assessed following analyses conducted in SP-F15. Additional analyses would be needed to evaluate the feasibility, risk, and likelihood of success associated with re-introduction of spring-run Chinook salmon upstream of the first migration barrier and the likelihood of accomplishing the goal w	Category 2 - Waiting: Feather River to first upstream migration barrier past Lake Oroville - SP-F15 results anticipated to be available by Dec 2003. Currently Incomplete: First upstream migration barrier past Lake Oroville upstream

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
7	EWG-15A	Incrementally increase flows in the low flow channel from relatively low flows (for example, 400-600 cfs or 600-800 cfs) to relatively high flows (for example, 800-1000 cfs or 1000-1200 cfs) throughout the Chinook salmon spawning season (for example, Sept 1 – Dec 1 or Sept 1 - Dec 15) in order change the lateral spawning habitat distribution from center of river channel during the early portion of the spawning season to margins of river channel in the later portion of the spawning season. Flows would be increased by some relatively consistent interval each week (for example, 25, 50, or 75 cfs/week) in order to increase usable spawning habitat and reduce superimposition of Chinook salmon redds. Once flows reach the high flow target, the high flow target would be maintained through May 30 in order to avoid dewatering steelhead redds through the incubation period.	Low Flow Channel	In the Feather River, there is no fully-executed documented study of flow changes being made to change spawning habitat lateral distribution. However, observations of Chinook salmon redd depth distribution changes to operational increases in flow have been made in 1992 (600cfs) vs. 1995 (1600cfs). Additionally, observations made during this flow increase suggest that at 1600 cfs, adult Chinook salmon spawners generally were observed in the margin areas as opposed to the thalweg. In addition to these observations, PHABSIM results will be able to provide additional information needed to evaluate the potential success of this action. The likelihood of this action accomplishing the goal can be evaluated once the PHABSIM results become available. A redd depth and location distribution monitoring effort would be needed to verify adult spawner response to this resource action.	Category 2 - Waiting: PHABSIM analysis from SP-F16 will provide information to support development of this Resource Action and is expected to be available by July 2003.

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
8	EWG-15B	Provide relatively low flows (for example, 400-800 cfs) in the low flow channel from the beginning of Chinook salmon spawning season (for example, Sept 1 – October 7 or September 1 - October 15) until spring-run Chinook salmon are believed to have spawned and then change flows to a relatively high flow (for example, 800-1200 cfs from October 8 - Dec 1 or October 16 - Dec 15) in order change the lateral spawning habitat distribution from center of river channel during the early portion of the spawning season to margins of river channel in the later portion of the spawning season. Flows would be increased once during the season in order to increase usable spawning habitat and reduce superimposition of spring-run Chinook salmon redds. Once flows reach the high flow target, the high flow target would be maintained through May 30 in order to avoid dewatering steelhead redds through the incubation period.	Low Flow Channel	In the Feather River, there is no fully-executed documented study of flow changes being made to change spawning habitat lateral distribution. However, observations of Chinook salmon redd depth distribution changes to operational increases in flow have been made in 1992 (600cfs) vs. 1995 (1600cfs). Additionally, observations made during this flow increase suggest that at 1600 cfs, adult Chinook salmon spawners generally were observed in the margin areas as opposed to the main river channel. In addition to these observations, PHABSIM results will be able to provide additional information needed to evaluate the potential success of this action. The likelihood of this action providing additional habitat will be determined once the PHABSIM results become available. Although the PHABSIM analysis will allow prediction of the resonponse of adult Chinook salmon spawners to flow increases, it will not aid in chosing a biologically justifiable date at which to increase the flow specifically for the benefit of spring-run Chinook salmon. If spring-run Chinook salmon spawning is nc	Category 2 - Waiting: PHABSIM analysis from SP-F16 will provide information to support development of this Resource Action and is expected to be available by July 2003. Additionally, the carcass survey recovery of fish tagged this year as entering the hatchery early will provide data that will be necessary to develop a biologically justifiable date for a flow increase. This data is expected to be available by January 2004. The results of the temporal distribution of the spring-run spawning may not be definitive and then would require a recommendation of "Currently Incomplete" and would require the development of an adaptive management program or additional studies in order to advance.

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
9	EWG-19B	Provide additional quantity and quality of spawning habitat and of egg incubation conditions for Chinook salmon and steelhead by managing seasonal water temperatures in the High Flow Channel. Water temperature management actions could include but are not limited to: - releasing colder water from Lake Oroville; - increasing the proportion of LFC flow in the HFC; - channelizing the Thermalito Afterbay; - decreasing the residence time of the water in the Thermalito Afterbay; and - altering pumpback operations. The mechanism for achieving water temperature targets at various locations could include an individual action or a combination of actions. The engineering and operations group modeling will help determine the specific action(s) that could result in achieving water temperature targets.	Thermalito Afterbay Outlet/High Flow Channel	Results of the literature review and analysis from SP-F10 Task 1D, describing water temperature-related effects on pre-spawning salmonids, and results of SP-F10 Task 2C, describing water temperature-related effects on the distribution of salmonid spawning and on egg and alevin survival, will provide information to support development of this Resource Action. The results of these literature reviews and analysis will provide the information regarding water temepratures effects, which generally occur throughout a continuum. As a result, even after the literature review and analysis for supporting tasks has been completed, it may be difficult to predict the success associated with any particular action (i.e., although colder water may generally be thought to result in decreased egg retention, it may not be possible to quantitatively predict the extent of decreased retention associated with a water temperature decrease of 1 degree as compared to a decrease of 3 degrees). In general, it is expected that decreased water temperatures would reduce egg retention and egg and alevin mortality, but specif	Category 2 - Waiting: Supporting data from SP-F10 Task 2C and Task 1D are expected to be available in Jan 2004 and Nov 2003.

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
10	EWG-83	Provide additional quantity and quality of rearing habitat by managing seasonal water temperatures in the high flow channel. Water temperature management actions could include but are not limited to: - releasing colder water from Lake Oroville; - increasing the proportion of LFC flow in the HFC; - channelizing the Thermalito Afterbay; - decreasing the residence time of the water in the Thermalito Afterbay; and - altering pumpback operations. The mechanism for achieving water temperature targets at various locations could include an individual action or a combination of actions. The engineering and operations group modeling will help determine the specific action(s) that could result in achieving water temperature targets.	Thermalito Afterbay Outlet/High Flow Channel	Results of the literature review and analysis from SP-F10 Task 3B, which describes water temperature-related effects on rearing juvenile salmonids, will provide information to support development of this Resource Action. The results of these literature reviews and analysis will provide the information regarding water temepratures effects, which generally occur throughout a continuum. As a result, even after the literature review and analysis for supporting tasks has been completed, it may be difficult to predict the success associated with any particular action (i.e., although colder water may generally be thought to result in decreased physiological stress to juvenile rearing salmonids, it may not be possible to quantitatively predict the extent of decreased physiological stress associated with a water temperature decrease of 1 degree as compared to a decrease of 3 degrees. Specific comparison of the water temperatures in the Feather River to water temperatures recommended for rearing juvenile salmonids will require the results of Task 3B of SP-F10. The likelihood of success of this	Category 2 - Waiting: Supporting data from SP-F10 Task 3B are expected to be available in July 2003.

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
11	EWG-35A	Reduce water temperatures at the Thermalito Afterbay Outlet to reduce the feeding rates of juvenile salmonid predators on rearing and emigrating juvenile salmonids in the Feather River. (TC-9)	Thermalito Afterbay Outlet/High Flow Channel	Results of the literature review and analysis from SP-F21 Tasks 1 and 3, which describe water temperature-related effects on predation of juvenile salmonids, will provide information to support development of this Resource Action. The results of these tasks will provide the information regarding water temepratures effects, which generally occur throughout a continuum. As a result, even after the literature reviews have been completed, it may be difficult to predict the success associated with any particular action (i.e., although colder water may generally be thought to result in decreased feeding rate of predators of juvenile rearing salmonids, it may not be possible to quantitatively predict the extent of decreased feeding rate associated with a water temperature decrease of 1 degree as compared to a decrease of 3 degrees). In general, it is expected that decreased water temperatures would reduce the feeding rate of predators of rearing juvenile salmonids, provided the predators are continually exposed to water temperatures that result in decreased metabolic rate. Because predato	Category 3 - Needs New Information: Although data describing predator feeding rate as it relates to water temperature is available, data describing the potential effectiveness of the use of water temperature manipulations as a mechanism for decreasing feeding rates in a river system where predators have the ability to utilize variable water temperature regimes is likely not available. As a result, although it is generally certain that when confined to colder water, decreased water temperatures would result in decreased feeding rates of juvenile salmonid predators, it is relatively uncertain how effective this strategy would be in an open system in which predators can differentially utilize varying water temperatures. Available information characterizing the relationship between water temperature and predator feeding rates is generally not likely to address these concerns. Therefore, there is not likely sufficient supporting science available to support development of this resource action to a point where its success can be relatively certain.
12	EWG-35B	Reduce water temperatures in particular areas of the Feather River to exclude predators of rearing and emigrating juvenile salmonids. (TC-9)	To-be-defined: portions of the Low Flow Channel and/or High Flow Channel depending on distribution of target species and target temperature thresholds	Preferred temperatures for predator fish species are well documented, but temperature tolerance for transient exposure to lower water temperatures is not clearly or consistently documented. Response of the predator composition and fish behavior from temperature manipulations is also not known or predictable. Other predator species may fill predation niches left vacant or with reduced competitive pressures. Predation of emigrating juvenile salmonids may only be move to locations lower in the river, without necessarily accomplishing the goal of reduced overall predation losses of juvenile salmonids.	Category 3 - Needs New Information: Although data describing predator water temperature preferences is available, data describing the potential effectiveness of the use of water temperature manipulations as a mechanism for predator exclusion in a river system where predators have the ability to utilize variable water temperature regimes is likely not available. Therefore, there is not likely sufficient supporting science available to support development of this resource action to a point where its success can be relatively certain.

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
13	EWG-16A	Create side-channel habitat adjacent to the low-flow reach in the Feather River. DWR studies have found that juvenile steelhead trout strongly select shallow riffle/glide, near-shore habitats with abundant riparian and in-stream cover. Habitats meeting these criteria are most often found in side-channels. Currently preferred habitats of juvenile steelhead are not common in the Low Flow Channel (LFC). To expand availability of preferred rearing habitat, side channels should be constructed at various suitable areas within the LFC. Rearing habitat in the LFC is particularly important for steelhead because of the extended freshwater residency of juvenile steelhead, but the created rearing habitat would also benefit Chinook salmon.	Potential sites for side channel creation in the Low Flow Channel include gravel bar areas adjoining Aleck Riffle, Robinson Riffle/Borrow Pond, Steep Riffle, Eye Riffle and Gateway Riffle.	There is some level of uncertainty in the likelihood that creating side-channel habitat in a river below a major dam would result in a long-term increase in production of juvenile steelhead and Chinook salmon. Moe's Ditch is a side channel created in the upper portion of the LFC during the 1970's to provide additional salmonid spawning habitat. The channel has provided additional spawning in a number of years, but has required extensive maintenance and restoration many times following damage from high flow events. Creation of a side channel could ultimately cause shift in the main river channel possibly resulting in loss of valuable habitat. Long-term success and persistence of side channels depends greatly on flow regime. If regular high flows (exceeding bank-full flow) are provided to the LFC, created side channels may be rapidly altered or eliminated. Under such conditions, allowing the river to create side channels naturally would be a more sustainable strategy. Detailed site evaluations will be necessary to determine which sites are most amenable to side channel creation. There is some ris	Category 2 - Waiting: While it is highly likely that increasing suitable side channel habitat would lead to increased production of juvenile salmonids, the optimal design for constructing such habitat and the most suitable project operations for sustaining the habitat are poorly known. Therefore, an adaptive management and monitoring program would need to be implemented as part of this action.

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
14	EWG-16B	Restore and/or improve side-channel habitat adjacent to the low-flow reach in the Feather River. Two existing side channels at the upstream end of the Low Flow Channel, Hatchery Ditch and Moe's Ditch, would benefit from habitat and flow enhancements. Hatchery Ditch, a primary steelhead spawning and rearing reach, is currently fed solely by seepage from the Feather River Hatchery (FRH) settling pond. Discharge in Hatchery Ditch is directly related to water use in the hatchery. Hatchery Ditch requires its own water source so that it can function independently. This need is particularly pressing since the FRH water system is overdue for a major overhaul, which requires shutting down the hatchery water supply for several months. Habitat in portions of Hatchery Ditch would also benefit from placment of additional instream physical structures to increase flow breaks and provide greater habitat complexity. Moe's Ditch is a man-made spawning channel adjacent to Hatchery Ditch. Currently Moe's Ditch suffers from a lack of flow (due to upstream changes in bed morphology and a bea	Hatchery Ditch and Moe's Ditch in the Low Flow Channel	Restored side-channel habitat would likely result in an increase in production of juvenile steelhead and Chinook salmon, the sustainability and maintanence requirements to acheive a long term benefit are less certain. Moe's Ditch was created during the 1970's to provide additional salmonid spawning habitat. The channel has provided additional spawning in a number of years, but has required extensive maintenance and restoration many times following damage from high flow events. Hatchery Ditch is dependent upon inflows from the Hatchery settling ponds. If the settling ponds are modifieed as planned, this habitat may be substantially altered or eliminated. Long-term success and persistence of side-channel restoration measures depends on flow regime. If regular high flows (exceeding bank-full flow) are provided to the LFC, side-channel enahncements may be rapidly altered or eliminated. Under such conditions, allowing the river to create side-channels naturally would be a more prudent strategy than restoring existing side channels. Under a more constant flow regime, such as that curr	Category 2 - Waiting: While it is highly likely that restoring side-channel habitat would lead to increased production of juvenile salmonids, the optimal design for enhancing such habitat and the most suitable project operations for sustaining the habitat are poorly known. Therefore, an adaptive management and monitoring program would need to be implemented as part of this action.

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
15	EWG 89	Set back levees in the low flow reach, where feasible.	Specific locations within the low flow reach to be determined on the basis of land availability, potential for creating beneficial effects and low probability of adverse geomorphic, hydrologic or biological effects. Candidate locations could include Borrow Pit and South wildlife area (lower half of LFC).	Success of levee setbacks depends on flow regime. Unless regular high flows mimicking a natural flow regime are provided, set-back levees would have only limited value. Some contouring of land could be required to minimize areas with potential for stranding juvenile salmonids. Steelhead habitat was not historicaly (pre-construction) in this area, so the likelihood that the changes resulting from river meanders would benefit steelhead are uncertain.	Category 2: Waiting: (G2-September?)

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
16	EWG 22	Set back levees in some selected areas in the lower Feather River	Specific locations within the lower Feather River to be determined on the basis of land availability, potential for creating beneficial effects and low probability of adverse geomorphic, hydrologic or biological effects. (Star Bend?)	It is relatively likely that setting back levees would potentially be biologically beneficial for juvenile salmonids, spawning splittail and native terrestrial species; the major uncertainty of this potential action is based on the feasibility of the project from substantial anticipated regulatory compliance issues. Repositioning levees may affect flood control.	Category 2: Waiting - Ongoing studies associated with SP-G2 will provide additional data (September?)
17	EWG 94	Develop a means by which higher flows in the Feather River can be diverted to OWA ponds.	Oroville Wildlife Area (selected ponds)	May create some salmonid rearing habitat, but would result in substantial access and refuge to juvenile salmonid predators. Overall, this potential action is likely not beneficial to salmonids and potentially positive concepts represented in this potential action can be represented in other PM&E's..	Category 4: Not recommended - beneficial concepts of EWG-94 are covered by EWG-16A and EWG-22. EWG-94 has potentially undesirable results in potentially creating salmonid predator and juvenile stranding habitat. Merge salvagable concepts into EWG 16A, 22
18	EWG 19A	Modify existing or build vegetated "benches" at various stage elevations in the lower Feather River (i.e. near Verona) to enhance splittail spawning habitat and Chinook salmon rearing habitat.	Lower Feather River	Management of flow regiemes targeted to innundate the benches at specific fish lifeestage timing would be essential to the success of this potential resource action. The effects of geomorphic construction on downstream flooding and erosion need to be evaluated. Uncertain whether or not Fluvial 12 can model the hydrologic and geomorphic effects of created floodplain surfaces.	Category 2: Waiting - G2 (September?)

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
19	EWG-10A	Provide resident fish with access to the upstream tributaries by removing sediment plugs which block asses to the upstream tributaries of Lake Oroville to increase the quantity and quality of available coldwater fishery spawning habitat. (Upstream Tributaries)	At various sediment plugs in the tributaries upstream of Lake Oroville within the fluctuation zone of Lake Oroville. Specific location to be determined by SP-G1 study plan results.	Although it is very certain that the use of mechanical equipment could successfully accomplish removal of sediment plugs, it is currently uncertain whether or not 1) removing sediment plugs would provide additional quality salmonid spawning habitat; 2) resident coho (or trout) would utilize the newly available spawning habitat; or 3) coho (or trout) spawning success would be improved by such an action. SP-G1 and SP-F3.1 will provide information relating to salmonid spawning habitat, while SP-F5/7 will provide information regarding interactions of Lake Oroville fish with tributary fish. Because the response of the resource to this action is uncertain, the response of the resource to the action would need to be monitored in order to determine the response and the actions would need to adaptively managed. Sediment plugs are transient (temporary and constantly changing) and only potential barriers or impediments to upstream migration at reservoir stage elevations that are below the exposed plug, so this potential action would be addressing an "intermittant problem" and may have potentially adve	Category 4: Not recommended - Unless this needs to be considered in context of the EWG-97 proposal
20	EWG-23	Provide increased flows in the High Flow Channel in order to inundate floodplains to provide high quality Chinook salmon rearing and splittail spawning and rearing habitat.	High Flow Channel - Lower Feather River (e.g. Sutter By-Pass for splttail spawning)	The level of certainy of flow increases providing additional habitat in floodplain areas for rearing splittail and Chinook salmon will be determined based on the results of the related study plans, including SP-F16, SP-G2, SP-T4, and SP-F3.2. It is generally expected that in flood plain areas, increased flows (to the appropriate extent) would result in inundation of new habitat. Potential loss of existing habitat could occur as a result of the flow increase, which may result in no net change in habitat quantity. Therefore, analyses from related study plans will be required in order to determine the certainty that increased flows would provide additional quality and quantity of rearing habitat.	Category 2 Waiting: G2 transect data (September?)

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
21	EWG-36	Provide additional quantity and quality of spawning habitat and improved egg incubation conditions for Chinook salmon and additional quantity and quality of spawning habitat, improved egg incubation conditions, and additional quantity and quality of rearing habitat for steelhead by managing water temperatures in the Low Flow Channel. Water temperature management actions could include but are not limited to: - releasing colder water from Lake Oroville;and/or - increasing the volume of water released in the LFC. The mechanism for achieving water temperature targets at various locations could include an individual action or a combination of actions. The engineering and operations group modeling will help determine the specific action(s) that could result in achieving water temperature targets.	Low Flow Channel	Results of the literature review and analysis from SP-F10 Task 1D, describing water temperature-related effects on pre-spawning salmonids, results of SP-F10 Task 2C, describing water temperature-related effects on the distriubtion of salmonid spawning and on egg and alevin survival, and results of SP-F10 Task 3B, describing water temperature related effects on juvenile rearing steelhead, will provide information to support development of this Resource Action. The results of these literature reviews and analysis will provide the information regarding water temepratures effects, which generally occur throughout a continuum. As a result, even after the literature review and analysis for supporting tasks has been completed, it may be difficult to predict the success associated with any particular action (i.e., although colder water may generally be thought to result in decreased egg retention or decreased physiological stress on rearing salmonids, it may not be possible to quantitatively predict the extent of decreased retention or decreased physiological stres	Category 2 Waiting: Supporting data from SP-F10 Task 2C, Task 1D, and Task 3B are expected to be available in Jan 2004, Nov 2003, and June 2003.
22	EWG-2 Formerly 2A - Merged 2A and 2B as they are the same proposal with alternative, but not mutually exclusive, design elements suggested	Install a weir (from July 1st to November 15th) (and/or a size exclusion device) to selectively pass desired fish species into the low flow channel. Currently, fishes in the Feather River are allowed free access into the upper portions of the low flow channel. This Resource Action would address concerns about high salmonid spawning densities in the low flow channel and provide an opportunity to segregate the spring and fall runs of Chinook salmon in the Feather River. Optionally, the device could be adapted to exclude predator species during juvenile salmonid rearing. (Low Flow Channel)	lower end of low flow section or "near "Bedrock Park"	Although the ability to design and construct a passage device to exclude late season Chinook salmon up migrants from the upper portion of the low flow channel while passing rearing juvenile salmonids is fairly likely, the temporal distribution of the spring vs. fall-run Chinook salmon has not been defined (and in all likelihood is significantly temporally overlapped) so the ability to successfully separate spring-run vs. fall-run Chinook salmon is not at all certain until their temporal distribution and inter-annual variability in distribution is defined.	Category 1 Complete: Until the temporal distribution of the spring-run vs. fall-run Chinook salmon and interannual variations in run timing are defined, any proposed action to separate the runs using an exclusion device would need to be adaptively managed.

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
23	EWG-2B Covered by EWG-2	Install a size exclusion device such as a lattice grating from July 1st to November 15th in order to provide spatial separation of holding and spawning habitat for spring-run and fall-run Chinook salmon. The latticed grate would be designed to block movement of adult salmonids but not juveniles. (Low Flow Channel)	near Bedrock Park		Category 4 Not Recommended - redundant with EWG-2
24	EWG-41 Covered by EWG-2	Use a weir to monitor and restrict access of returning adult Chinook salmon to the low flow section of the Feather River. This Resource Action potentially would reduce genetic introgression between Chinook races and between hatchery/wild salmonids. This Resource Action also would potentially reduce crowding and competition for limited spawning habitat. (Low Flow Channel)	lower end of low flow section		Category 4 Not Recommended - redundant with EWG-2
25	EWG-34	Exclusionary devices (e.g., weirs) would have a potential benefit of reducing predation on salmonids in the low flow section of the Feather River. (Low Flow Channel)	lower part of the low flow section	The ability to design and construct a low-head dam and wier to exclude the swimming and leaping performance of predator species and allowing for adult and juvenile salmonid passage is uncertain. Adult salmonid passage while excluding predators is more likely, but the device would need to pass rearing juveniles (steelhead) in order not to reduce the amount of rearing habitat available to them. Excluding predators, while passing juvenile salmonids may be problematic. Additionally, predators are already fully distributed in the area that would be excluded by the construction. Unless the program was coupled with a predator removal program or disrupted the sustainability of the predators, e.g. no spawning or rearing habitat for the predator species in the exclusion area, the program would not likely be substantially successful except for seasonal predator species, e.g. striped bass. It is also uncertain as to the resulting effect on the river ecosystem with potential alterations to the predator species composition and behavior as well as effect on juvenile salmonid development of "preda	Category 4 Not Recommended: Concept of exclusionary device is represented as an option in EWG-2

	A	B	C	D	E
2	**Resource Action Number**	**Resource Action Description**	**Resource Action Location**		**Fisheries Task Force Recommended Grouping**
26	EWG-18 Covers EWG-90	In areas where armoring has occurred, selected sections of the low-flow reach of the Feather River would be ripped (or raked depending on conditions) with the goal of improving spawning gravel quality. (Low Flow Channel)	Upper end of low flow channel (Auditorium, Bedrock Park, Mathews?)	If armoring has occurred and there are suitable substrate compositions that would benefit from the mixing of deep ripping and the Fluvial 12 model indicates the size composition would have a reasonable functional life-span, the action has a reasonable likelihood for success. Some investigation on various ripping implement designs and configurations may need to be done to ensure proper substrate mixing in the range on conditions anticipated. This action has been historically implemented, but has not been recently practiced due to the environmental impacts from the resulting turbidity?	Category 2 Waiting - As soon as the G2 results on armoring and the F10 task 2A results (Jan '04) on spawning gravel suitability are available, all of the information to evaluate the feasibility and desirability of this proposed action will be available.
27	EWG-90 Covered by EWG-18	Rip sections of the low-flow reach to improve spawning gravel composition for Chinook salmon and steelhead. This Resource Action is not specific to location at this time; results from ongoing geomorphology studies (SP-G2) will be used to better define ripping and target locations in the low-flow reach. (Low Flow Channel)			Category 4 Not Recommended - Was moved from Geomorphic to Fisheries and was covered by EWG-18.
28	EWG-91 Covered by EWG-92	Supplement the low-flow reach with suitable spawning gravel to increase productivity (i.e., # fish produced per unit area). (Low Flow Channel)			Category 4 Not Recommended - Was covered by EWG-91.
29	EWG-92 Covers EWG-91	Gravel replacement on the lower reach spawning riffles if these areas are found to be of poor spawning quality (ongoing, SP-G2). (Low Flow Channel)	Upper end of low flow channel	If coarsening of gravel sizes has occurred that exceed suitable salmonid spawning substrate compositions and the Fluvial 12 model indicates the gravel supplement size composition would have a reasonable functional life-span, the action has a reasonably good likelihood for success.	Category 2 Waiting - As soon as the G2 results on armoring and the F10 task 2A results (Jan '04) on spawning gravel suitability are available, all of the information to evaluate the feasibility and desirability of this proposed action will be available.